



Sequence Listing

<110> E.I. du Pont de Nemours and Company

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<141> 2001-08-02

<150> PCT/US00/34396

<151> 2000-12-19

<150> 60/172944

<151> 1999-12-21

<160> 28

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35 40 45

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Gln Ala Asp Gly Gly Asp Gly Val Leu Gly Ala Pro Val Leu Gly Gly  
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Asp	Gln	Leu	Ser	Val	Val	Met	Lys	Phe	Gly	Gly	Ser	Ser	Val	Ser	Ser	85	90	95
Ala	Ala	Arg	Met	Ala	Glu	Val	Ala	Gly	Leu	Ile	Leu	Thr	Phe	Pro	Glu	100	105	110
Glu	Arg	Pro	Val	Val	Val	Leu	Ser	Ala	Met	Gly	Lys	Thr	Thr	Asn	Asn	115	120	125
Leu	Leu	Leu	Ala	Gly	Glu	Lys	Ala	Val	Gly	Cys	Gly	Val	Ile	His	Val	130	135	140
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 35 40 45  
 Thr Asp Asp Phe Thr Asn Ala Asp Ile Leu Glu Ala Thr Tyr Pro Ala  
 50 55 60  
 Val Ala Lys Arg Leu Gln Gly Asp Trp Ile Asp Asp Pro Ala Ile Pro  
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ggttcaccgt cgccatgaag ttcggcgggt cgtcgggtggc gtcggcggag cggatgcggg 240
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tggggaagac caccaataac ctctctctgg ccggagagaa ggctgtcagc tgcggcgccc 360
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<212> PRT
<213> Oryza sativa

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Ala Arg Pro Gly Gly Arg Cys Ser Arg Arg Arg Gly Leu Val Val Arg
      20             25             30

Cys Gln Ser Gly Ala Ala Ala Val Val Leu Asn Lys Asp Asp Ala Ala
      35             40             45

Ser Val Ala Ala Ala Ala Ala Ser Ser Ala Thr Gly Phe Thr Val Ala
      50             55             60

Met Lys Phe Gly Gly Ser Ser Val Ala Ser Ala Glu Arg Met Arg Glu
      65             70             75             80

Val Ala Asp Leu Ile Leu Ser Phe Pro Glu Glu Thr Pro Val Val Val
      85             90             95

Leu Ser Ala Met Gly Lys Thr Thr Asn Asn Leu Leu Leu Ala Gly Glu
      100            105            110

Lys Ala Val Ser Cys Gly Ala Pro Lys Ala Ser Glu Ile Pro Glu Leu
      115            120            125

Ala Val Ile Lys Glu Leu His Val Arg Thr Ile Asp Glu Leu Gly Leu
      130            135            140

Asp Arg Ser Ile Val Ser Gly Leu Leu Glu Glu Leu Glu Gln Leu Leu
      145            150            155            160

Lys Gly Val Ala Met Met Lys Glu Leu Thr Pro Arg Thr Arg Asp Tyr
      165            170            175

Leu Val Ser Phe Gly Glu Cys Met Ser Thr Arg Ile Phe Ala Ala Tyr
      180            185            190

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Leu Asn Lys Leu Gly Lys Lys Ala Arg Gln Tyr Asp Ala Phe Asp Ile  
 195 200 205  
 Gly Phe Ile Thr Thr Asp Asp Phe Thr Asn Ala Asp Ile Leu Glu Ala  
 210 215 220  
 Thr Tyr Pro Ala Val Ala Lys Arg Leu Gln Gly Asp Trp Ile Asp Asp  
 225 230 235 240  
 Pro Ala Ile Pro Ile Val Thr Gly Phe Leu Gly Lys Gly Trp Lys Ser  
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 <212> DNA  
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 ggacgagttg gagcaactgc tcaaggggtg tgctatgatg aaagagctga ctcttaggac 180  
 acgagattac cttgtttcct ttggtgaatg catgtctaca agaataatattt ctgcatattt 240  
 gaataaacta gggaagaagg cacgacagta tgatgctttt gatcttggnt ttataaccac 300  
 tggacgattt ccacaaatgc cgatatccnc gaacaactta tcctgctgtt gcaaagagct 360  
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 gaacttgtgc ggcanaactt aggaaggggc ggaatgactt gacggcacia ccatgggaaa 480  
 cctgggggta agaaaatcag gttggaagat gtaacgggtt tgactgtgat caatattatc 540  
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 <212> PRT  
 <213> Triticum aestivum

<220>  
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 <222> (110)  
 <223> Xaa=any amino acid

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 <223> Xaa=any amino acid

<220>  
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 <223> Xaa=any amino acid

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 Val Ile Lys Glu Leu His Leu Arg Thr Ile Asp Glu Leu Gly Leu Asp  
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 Ser Ser Ile Val Ser Gly Phe Leu Asp Glu Leu Glu Gln Leu Leu Lys  
 35 40 45

Gly Val Ala Met Met Lys Glu Leu Thr Leu Arg Thr Arg Asp Tyr Leu  
50 55 60

Val Ser Phe Gly Glu Cys Met Ser Thr Arg Ile Phe Ser Ala Tyr Leu  
65 70 75 80

Asn Lys Leu Gly Lys Lys Ala Arg Gln Tyr Asp Ala Phe Asp Leu Gly  
85 90 95

Phe Ile Thr Thr Gly Arg Phe Pro Gln Met Pro Ile Ser Xaa Asn Asn  
100 105 110

Leu Ser Cys Cys Cys Lys Glu Leu His Gly Asn Trp Leu Met Thr Leu  
115 120 125

Leu Ser Xaa Tyr Asp Gly Ser Leu Gly Lys Gly Trp Asn Leu Cys Gly  
130 135 140

Xaa Thr  
145

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<211> 1658  
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actccttagga cagcagatta ccttggtttcc tttggtgaat gcatgtctac aagaatattt 240  
tctgcatatt tgaataaaact agggaagaag gcacgacagt atgatgcttt tgatcctggc 300  
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gcaaagaggc tacatggaga ttggattgat gacctgcta ttcctatagt gactggtttc 420  
cttgggaagg gatggaaatc ttgtgcggtc acaacgtag gaaggggcgg cagtgcattg 480  
accgctacaa ccattggcaa agccttgggg ttaagagaaa ttcaggtttg gaaggatgta 540  
gacggtgtgt tgacgtgtga tccaaatatt tatgcaaacg cgggtaccagt accctacttg 600  
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gcacctggca ctgtgatcac taaaacaaga gatatgcgca agagcatatt aaccagcatt 780  
gtcctgaaat caaatattac catgctggat atagttagca caaggatgct cggacagtat 840  
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gctactagtg aagtcagcat atcattgaca ctagatccat caaaactgtg gagtcgtgaa 960  
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cttgagaagg cgttcaatgt tctacgcaga aatggtgtta atgttcagat gatttcgcaa 1140  
ggggcggtcca aggtgaacat ctcccttggtg gtgaatgaca gcgaggcgaa gcagtgcgtg 1200  
caagccctcc actcggcatt ctttgagaac ggtttcttgt cagaagtaga ggaagcggac 1260  
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tgggtgtgta agagtgcga gcatgattct tcgagtgcga gcatatggta gcccaatcaa 1500  
tgtatgtgat tgtgagcgt cctacttgct gaacttaacc attgtgagga gccctatga 1560  
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aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaa 1658

<210> 16  
<211> 439

<212> PRT

<213> Triticum aestivum

<400> 16

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35 40 45  
Gln Leu Leu Lys Gly Val Ala Met Met Lys Glu Leu Thr Leu Arg Thr  
50 55 60  
Arg Asp Tyr Leu Val Ser Phe Gly Glu Cys Met Ser Thr Arg Ile Phe  
65 70 75 80  
Ser Ala Tyr Leu Asn Lys Leu Gly Lys Lys Ala Arg Gln Tyr Asp Ala  
85 90 95  
Phe Asp Leu Gly Phe Ile Thr Thr Asp Asp Phe Thr Asn Ala Asp Ile  
100 105 110  
Leu Glu Ala Thr Tyr Pro Ala Val Ala Lys Arg Leu His Gly Asp Trp  
115 120 125  
Ile Asp Asp Pro Ala Ile Pro Ile Val Thr Gly Phe Leu Gly Lys Gly  
130 135 140  
Trp Lys Ser Cys Ala Val Thr Thr Leu Gly Arg Gly Gly Ser Asp Leu  
145 150 155 160  
Thr Ala Thr Thr Ile Gly Lys Ala Leu Gly Leu Arg Glu Ile Gln Val  
165 170 175  
Trp Lys Asp Val Asp Gly Val Leu Thr Cys Asp Pro Asn Ile Tyr Ala  
180 185 190  
Asn Ala Val Pro Val Pro Tyr Leu Thr Phe Asp Glu Ala Ala Glu Leu  
195 200 205  
Ala Tyr Phe Gly Ala Gln Val Leu His Pro Gln Ser Met Arg Pro Ala  
210 215 220  
Arg Glu Gly Gly Ile Pro Val Arg Val Lys Asn Ser Tyr Asn Arg His  
225 230 235 240  
Ala Pro Gly Thr Val Ile Thr Lys Thr Arg Asp Met Arg Lys Ser Ile  
245 250 255  
Leu Thr Ser Ile Val Leu Lys Ser Asn Ile Thr Met Leu Asp Ile Val  
260 265 270  
Ser Thr Arg Met Leu Gly Gln Tyr Gly Phe Leu Ala Lys Val Phe Ser  
275 280 285  
Ile Phe Glu Asp Leu Gly Ile Ser Val Asp Ser Val Ala Thr Ser Glu  
290 295 300

Val Ser Ile Ser Leu Thr Leu Asp Pro Ser Lys Leu Trp Ser Arg Glu  
 305 310 315 320  
 Leu Ile Gln Gln Glu Leu Asp His Val Val Glu Glu Leu Glu Lys Ile  
 325 330 335  
 Ala Val Val His Leu Leu Gln His Arg Ser Ile Ile Ser Leu Ile Gly  
 340 345 350  
 Asn Val Gln Arg Ser Ser Leu Ile Leu Glu Lys Ala Phe Asn Val Leu  
 355 360 365  
 Arg Arg Asn Gly Val Asn Val Gln Met Ile Ser Gln Gly Ala Ser Lys  
 370 375 380  
 Val Asn Ile Ser Leu Val Val Asn Asp Ser Glu Ala Lys Gln Cys Val  
 385 390 395 400  
 Gln Ala Leu His Ser Ala Phe Phe Glu Asn Gly Phe Leu Ser Glu Val  
 405 410 415  
 Glu Glu Ala Asp Leu Ala Gln Lys Arg Ala Pro Val Leu Val Ser Ser  
 420 425 430  
 Asn Gly Ala Ile Asn Gly Asn  
 435  
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 <211> 564  
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 <213> Glycine max  
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 Gly Phe Ala Ala Leu Gly Ala Pro Val Cys Ala Arg Arg Val Trp Gly  
 35 40 45  
 Asn Arg Val Ala Phe Ser Val Thr Thr Cys Lys Ala Ser Thr Ser Asp  
 50 55 60  
 Val Ile Glu Lys Asn Ala Thr Glu Asn Gly Met Val Ser Ser Glu Gly  
 65 70 75 80  
 Glu Thr Ser Phe Thr Cys Val Met Lys Phe Gly Gly Ser Ser Val Ala  
 85 90 95  
 Ser Ala Asp Arg Met Lys Glu Val Ala Thr Leu Ile Leu Ser Phe Pro  
 100 105 110  
 Glu Glu Arg Pro Ile Val Val Leu Ser Ala Met Gly Lys Thr Thr Asn  
 115 120 125  
 Lys Leu Leu Leu Ala Gly Glu Lys Ala Val Ser Cys Gly Val Ile Asn  
 130 135 140

Val	Ser	Ser	Ile	Glu	Glu	Leu	Cys	Phe	Ile	Lys	Asp	Leu	His	Leu	Arg	145	150	155	160
Thr	Val	Asp	Gln	Leu	Gly	Val	Asp	Gly	Ser	Val	Ile	Ser	Lys	His	Leu	165	170	175	
Glu	Glu	Leu	Glu	Gln	Leu	Leu	Lys	Gly	Ile	Ala	Met	Met	Lys	Glu	Leu	180	185	190	
Thr	Lys	Arg	Thr	Gln	Asp	Tyr	Leu	Val	Ser	Phe	Gly	Glu	Cys	Met	Ser	195	200	205	
Thr	Arg	Ile	Phe	Ala	Ala	Tyr	Leu	Asn	Lys	Ile	Gly	Val	Lys	Ala	Arg	210	215	220	
Gln	Tyr	Asp	Ala	Phe	Glu	Ile	Gly	Phe	Ile	Thr	Thr	Asp	Asp	Phe	Thr	225	230	235	240
Asn	Ala	Asp	Ile	Leu	Glu	Ala	Thr	Tyr	Pro	Ala	Val	Ala	Lys	Arg	Leu	245	250	255	
His	Gly	Asp	Trp	Leu	Ser	Asp	Pro	Ala	Ile	Ala	Ile	Val	Thr	Gly	Phe	260	265	270	
Leu	Gly	Lys	Ala	Arg	Lys	Ser	Cys	Ala	Val	Thr	Thr	Leu	Gly	Arg	Gly	275	280	285	
Gly	Ser	Asp	Leu	Thr	Ala	Thr	Thr	Ile	Gly	Lys	Ala	Leu	Gly	Leu	Pro	290	295	300	
Glu	Ile	Gln	Val	Trp	Lys	Asp	Val	Asp	Gly	Val	Leu	Thr	Cys	Asp	Pro	305	310	315	320
Asn	Ile	Tyr	Pro	Lys	Ala	Glu	Pro	Val	Pro	Tyr	Leu	Thr	Phe	Asp	Glu	325	330	335	
Ala	Ala	Glu	Leu	Ala	Tyr	Phe	Gly	Ala	Gln	Val	Leu	His	Pro	Gln	Ser	340	345	350	
Met	Arg	Pro	Ala	Arg	Glu	Ser	Asp	Ile	Pro	Val	Arg	Val	Lys	Asn	Ser	355	360	365	
Tyr	Asn	Pro	Lys	Ala	Pro	Gly	Thr	Leu	Ile	Thr	Lys	Ala	Arg	Asp	Met	370	375	380	
Ser	Lys	Ala	Val	Leu	Thr	Ser	Ile	Val	Leu	Lys	Arg	Asn	Val	Thr	Met	385	390	395	400
Leu	Asp	Ile	Ala	Ser	Thr	Arg	Met	Leu	Gly	Gln	Tyr	Gly	Phe	Leu	Ala	405	410	415	
Lys	Val	Phe	Ser	Ile	Phe	Glu	Glu	Leu	Gly	Ile	Ser	Val	Asp	Val	Val	420	425	430	
Ala	Thr	Ser	Glu	Val	Ser	Val	Ser	Leu	Thr	Leu	Asp	Pro	Ser	Lys	Leu	435	440	445	
Trp	Ser	Arg	Glu	Leu	Ile	Gln	Gln	Ala	Ser	Glu	Leu	Asp	His	Val	Val	450	455	460	



Glu Glu Leu Glu Lys Ile Ala Val Val Asn Leu Leu Gln Asn Arg Ser  
 465 470 475 480

Ile Ile Ser Leu Ile Gly Asn Val Gln Arg Ser Ser Leu Ile Leu Glu  
 485 490 495

Arg Leu Ser Arg Val Leu Arg Thr Leu Gly Val Thr Val Gln Met Ile  
 500 505 510

Ser Gln Gly Ala Ser Lys Val Asn Ile Ser Leu Val Val Asn Asp Ser  
 515 520 525

Glu Ala Glu Gln Cys Val Arg Ala Leu His Ser Ala Phe Phe Glu Ser  
 530 535 540

Glu Leu Ser Glu Leu Glu Met Asp Tyr Lys Asn Gly Asn Gly Ser Val  
 545 550 555 560

Asp Glu Leu Ser

<210> 18

<211> 17

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic oligonucleotide

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17

<210> 19

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic oligonucleotide

<400> 19

gactggtacc tcagcccacg agtaggt

27

<210> 20

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic oligonucleotide

<400> 20

gactccatgg agggattggg gga

23

<210> 21

<211> 19

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:Synthetic oligonucleotide

<400> 21  
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<210> 22  
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<400> 22  
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<210> 23  
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<212> DNA  
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<210> 24  
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<210> 26  
<211> 11  
<212> PRT  
<213> Escherichia coli

<220>  
<223> DOMAIN

<400> 26

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1 5 10

<210> 27  
<211> 12  
<212> PRT  
<213> Zea maize

<220>  
<223> DOMAIN

<400> 27  
Ser Ser Arg Met Leu Gly Gln Tyr Gly Phe Leu Ala  
1 5 10

<210> 28  
<211> 12  
<212> PRT  
<213> Escherichia coli

<220>  
<223> DOMAIN

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1 5 10